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Tuna Newsletter

National Marine Fisheries Service
● Southwest Region
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U.S. TUNA STATISTICS

Editor's note: The regularly featured article **Canned Tuna Industry Highlights** *does not appear in this issue. Cannery receipts for the third and fourth quarters of 1996 will be presented in the next issue of the Tuna Newsletter.*

1996 U.S. TUNA PRODUCTION

CANNED TUNA

1996 U.S. canned tuna production rose slightly from previous year's production, according to preliminary estimates. White meat (albacore) production totaled 76,500 mt (9.2 million standard cases of 48 6.125-oz cans) worth $352.1 million in 1996, compared to 74,500 mt (8.9 million standard cases) worth $380.9 million in 1995. Light meat (primarily yellowfin and skipjack tunas) production totaled 228,300 mt (27.4 million standard cases) worth $589.0 million, compared to 227,800 mt (27.3 million standard cases) worth $557.6 million in 1995. Total white and light meat production was 304,800 mt (36.6 million standard cases) worth $941.0 million compared to total 1995 production of 302,300 mt (36.3 million standard cases) worth $938.5 million.

PACIFIC TUNA CATCH

A year-end "flash estimate" based on incomplete statistics, assumptions on trends in the fisheries and from information gathered from personnel monitoring the fisheries was made by the SWFSC for the 1996 U.S. commercial tuna catch from the Pacific Ocean. We share this information (Table 1) with readers and note that the estimate of 202,600 mt of tuna caught in 1996 is down slightly from the 220,300 mt caught in 1995. Seventy-five percent of this catch came from the central-western Pacific. The species caught in greatest quantities Pacific-wide is skipjack tuna at 128,300 mt, followed by yellowfin tuna (41,900 mt) and albacore (19,000 mt). Skipjack tuna catches

Table 1. Estimated U.S. commercial Pacific Ocean tuna catches (mt) for 1995 and 1996.

Fishing Region	Yellowfin		Skipjack		Bigeye	
	1995	1996	1995	1996	1995	1996
E. Tropical	7,400	11,600	15,900	12,600	7,300	5,000
Central-Western	30,800	30,300	141,800	115,700	5,000	5,300
Total	38,200	41,900	157,700	128,300	12,300	10,300

Fishing Region	Bluefin		Albacore	
	1995	1996	1995	1996
Northern	600	3,100	9,200	16,900
Southern	0	0	2,300	2,100
Total	600	3,100	11,500	19,000

declined in 1996 while the two temperate tuna species, bluefin and albacore, showed strong gains.

U.S. TUNA FISHERIES UPDATE

EASTERN PACIFIC TROPICAL TUNA FISHERY

In 1996, 13 U.S. tuna purse seiners participated in the eastern tropical Pacific tuna fishery and caught an estimated 16,600 mt of yellowfin and bigeye tuna and 12,600 mt of skipjack tuna (Figure 1). The combined yellowfin and bigeye tuna

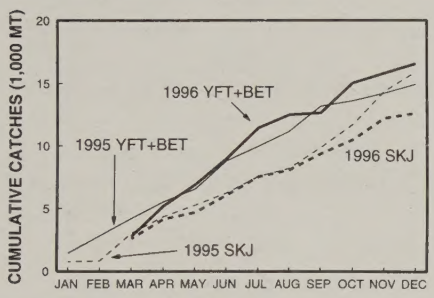

Figure 1. Cumulative tuna catches, by month, for the U.S. eastern tropical Pacific purse seine fishery, 1995 and 1996. Note that data are not available for the first two months of 1996.

catch was up 11% from the 1995 catch for the same period, while the skipjack tuna catch was down 21%.

The surface fleets (purse seiners and baitboats) of all nations fishing in the eastern Pacific Ocean caught an estimated 293,000 mt of yellowfin and bigeye tuna and 105,900 mt of skipjack tuna. The leading nation was Mexico with 36% of the total catch, followed by Ecuador and Venezuela, each with 16% of the catch. The U.S. fleet accounted for 8% of the tuna catch.

WESTERN PACIFIC TROPICAL TUNA FISHERY

In 1996, U.S. tuna purse seiners fishing in the western tropical Pacific under the South Pacific Tuna Treaty landed an estimated 114,900 mt of skipjack tuna and 31,400 mt of yellowfin and bigeye tuna (Figure 2).

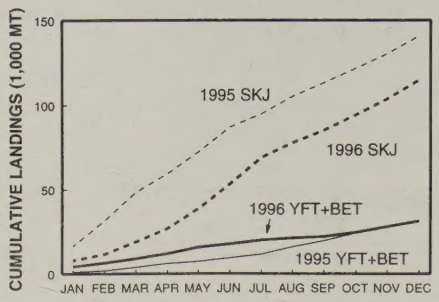

Figure 2. Cumulative tuna landings, by month, for the U.S. western tropical Pacific purse seine fishery, 1995 and 1996.

The skipjack tuna landings were down 18% and the combined yellowfin and bigeye tuna landings were down 1% from the 1995 landings for the same period. Forty vessels landed tuna from 156 trips in 1996 compared to 43 vessels and 180 trips in 1995. *(Report provided by Doug Prescott, NMFS Southwest Fisheries Science Center, La Jolla, CA)*

NORTHERN PACIFIC ALBACORE FISHERY

The 1996 U.S. North Pacific albacore troll season began in May 1996 north of Midway Island. Some vessels fished west of the international dateline and in the same areas as Japanese pole-and-line boats. Several troll vessels reported catching albacore with fresh gill net marks in areas near the international dateline. By July fishing effort was concentrated near 43°N latitude and 151°W longitude. Excellent catch rates were reported in August, and by September catches decreased but remained good.

Fishing along the U.S. West Coast improved compared to the 1995 season, but the excellent catch rates reported by the offshore fleet drew many of the coastal vessels to the offshore areas. Small amounts of albacore were caught off central and southern California. A preliminary estimate of total landings by U.S. vessels for the 1996 North Pacific fishery is 15,600 mt, about double the 1995 North Pacific landings (8,200 mt). The preliminary estimate of average CPUE for the 1996 North Pacific season is 85 fish/day compared to 49 fish/day in 1995. *(Report provided by John Childers, NMFS Southwest Fisheries Science Center, La Jolla, CA)*

SOUTHERN PACIFIC ALBACORE FISHERY

The 1996-97 South Pacific albacore fishery began in December 1996. Most of the fleet was expected to reach the fishing grounds in January. Preliminary reports indicate few fish were being caught in early January but average fish weight is heavier than normal.

Approximately 50 U.S. troll vessels participated in the 1995-96 fishery, landing 2,050 mt. South Pacific albacore landings by the troll fishery have been under 3,000 mt for the past four years. *(Report provided by John Childers, NMFS Southwest Fisheries Science Center, La Jolla, CA)*

WESTERN ATLANTIC BLUEFIN TUNA FISHERY

For the 1996 western Atlantic bluefin tuna fishery, a total of 5,045 bluefin tuna were landed with a gross weight of 946 mt and an average weight of 413 pounds (187 kg) per fish. A summary of landings is given in Table 2.

A new Automated Permitting System for vessels fishing for Atlantic tunas was implemented in January and can be accessed by telephone (1-888-USA-TUNA) or on the Internet at http://www.usatuna.com. A valid permit must be on board the vessel in order to fish for Atlantic tunas. Previously issued, unexpired permits are still valid, although NMFS will propose a rule change to require that all outstanding permits be renewed under the new system. A vessel operator whose Atlantic permit has expired may continue to fish with his expired permit on board the

Table 2. U.S. commercial landings of Atlantic bluefin tuna for 1996.

Category	Number of Fish	Avg. Wt. (lbs.)	Gross Wt. (mt)	Quota (mt)
GENERAL	3,268	387.8	574.9	573
Handline	176	408.0	32.6	
Harpoon	212	394.7	38.0	
Rod & Reel	2,880	386.1	504.3	
HARPOON	307	413.9	57.6	58
INCIDENTAL	267	538.8	65.3	90
N. Longline	98	476.4	21.2	33
S. Longline	161	587.1	42.9	56
Other	8	330.8	1.2	1
PURSE SEINE	1,184	455.8	244.8	251
ANGLING (Trophy)	19	355.2	3.1*	5
RESERVE	0	0.0	0.0	0
TOTAL	5,045	413.2	945.7	977

*Angling trophy category quota was attained. These data only reflect cards reported to, and received by, the NMFS. Additional data were received from North Carolina dockside intercepts and used to calculate total quota taken for the angling trophy category.

vessel until March 31, 1997. Before this deadline, vessel owners must renew their permits through the Automated Permitting System. Permits are now issued on an annual basis (they had previously been good for three years) and there is an $18.00 annual permit fee (it had been free). Current permit holders are being sent letters describing these changes. Permits for Atlantic tunas are valid under the same rules as in the past.

Several rule changes regarding bluefin tuna fishing will be published early in 1997. In addition, Atlantic highly migratory species (HMS) regulations regarding tunas, swordfish, sharks and billfish will be consolidated into one part of the Code of Federal Regulations (CFR), that is, under Title 50 CFR Part 630. Rules regarding the Atlantic bluefin tuna quota as well as days off and other effort controls for 1997 will be published shortly after the consolidated regulations are made final in January 1997. *(Report provided by Mark Murray-Brown, NMFS Northeast Region, Gloucester, MA)*

REPORTS

Editor's note: Original reports are published as a service to subscribers and may not represent the views of the NMFS. Readers should contact the authors of reports for details, if needed.

THE GROWING NEED FOR INTERNATIONAL COOPERATION TO CONSERVE PACIFIC HIGHLY MIGRATORY FISH

Editor's note: The Symposium on Managing Highly Migratory Fish of the Pacific Ocean was held November 4-6, 1996, in Monterey, California. The U.S. State Department Deputy Assistant Secretary for Oceans, Mary Beth West, delivered the Symposium's keynote speech. Her speech outlined the United States' overall view on how such fish stocks should be managed within the Pacific Basin. The following is a synopsis of Ms West's remarks.

It is an inescapable fact that the range of Pacific highly migratory fish stocks is so wide that no single nation, acting alone, can properly conserve and manage them. International cooperation is imperative if we are to ensure that these species are effectively conserved throughout their range. In the Pacific, most pelagic stocks, including species of tuna, swordfish and billfish, are not now managed through regional organizations or arrangements. To prevent the depletion of these stocks, we must articulate an approach for their conservation and management throughout the Pacific Basin.

As the U.S. sees it, this approach must build upon three principles:

1. The Pacific Ocean is too large and the issues of each subregion too complex for most Pacific pelagic stocks to be managed effectively by a single, ocean-wide fishery organization.
2. Pacific pelagic stocks should be managed in accordance with the United Nations highly migratory fish stocks agreement.
3. The need for flexibility (i.e., as we begin to build the necessary institutions, we must focus initially on data gathering and sharing, ensuring full participation, and setting the stage for management decisions when needed).

The process of advancing management of Pacific pelagic fish stocks is complicated by five factors:

1. The size of the Pacific Ocean makes ocean-wide management difficult to imagine, let alone to achieve.
2. The ranges of individual stocks are varied, and there is not full scientific agreement on the distribution of some of them.
3. The interests of the states involved are widely diverse. These include the interests of the states and territories of the United States and other Pacific coastal states (as well as Taiwan), interests of non-coastal states that have island territories in the Pacific; and the interests of states with distant water fleets fishing in the region.
4. The interests within the U.S. fishing industries involved in Pacific pelagic fisheries are varied. These interests depend on factors such as the spe-

cies sought, the type of fishing gear used, the area of fishing operations, the places the harvested fish are to be processed, and the amounts and types of by-catch.

5. Several international institutions exist with differing mandates—the IATTC, the South Pacific Forum Fisheries Agency, the South Pacific Commission, the Interim Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean, and the Asia Pacific Fishery Commission. These organizations and institutions provide the building blocks for conservation and management of Pacific pelagics, but additional international cooperation is needed to help them achieve their full potential.

The first front where international cooperation is needed is to bring the U.N. fish stocks agreement into force as soon as possible and to implement it aggressively. (Note: when the speech was delivered, four nations had deposited instruments of ratification of the U.N. fish stocks agreement and 51 nations had signed it; since then these figures have increased to five and 53, respectively.)

The second front requiring international cooperation involves strengthening the structure for the conservation and management of highly migratory fish stocks in the Pacific Ocean. The U.S. believes that progress can best be made through three subregional fisheries institutions covering the eastern Pacific, central/southern Pacific and the northern Pacific subregions.

The U.S. approach calls for building upon existing institutions where they exist, and working to create new ones where none is present. In the future, coordination among the subregions may be necessary; indeed, it should be planned for.

As our understanding of the distribution of certain species suspected to have ocean-wide distribution, such as swordfish, improves, we may also wish to consider developing a management regime with a broader geographic scope for such fish stocks. As part of our approach, we also believe that there is a pressing need for mechanisms that will achieve coordination and communication across subregions.

To do this correctly requires us to consider the significance of stock distribution in determining which subregional organizations would be most appropriate to the needs of Pacific pelagic stocks. A clear understanding of stock distribution is essential because some species such as skipjack and yellowfin tuna demonstrate a predominantly east-west distribution; others such as albacore and bluefin tuna appear to have distinct northern and southern hemisphere stocks; some such as bigeye tuna appear to have an ocean-wide range; and for others, such as swordfish, distribution is largely uncertain.

A SYNOPSIS OF SPAWNING SEASONALITY OF ALBACORE, *THUNNUS ALALUNGA*, IN THE SOUTH PACIFIC OCEAN

Darlene Ramon[1] & Kevin Bailey[2]

Understanding the reproductive biology of a species is important for stock assessment. Studies on the size of maturity, frequency of spawning, and length of the spawning season are needed to understand the process of recruitment into a fishery.

Two major fisheries target albacore in the South Pacific: a longline fishery concentrating on adult fish (80-110 cm) in tropical and subtropical waters (10-30°S latitude) throughout the year, and a surface troll fishery targeting subadults (50-80 cm) in temperate waters during the austral summer. The second South Pacific Albacore Research (SPAR) workshop recommended further study on the spawning seasonality of albacore in the South Pacific. A sampling and histological project was organized by the Tuna and Billfish Assessment Programme (TBAP) of the South Pacific Commission (SPC) and the Southwest Fisheries Science Center (SWFSC) to provide a better understanding of albacore reproduction in the South Pacific.

The purpose of our study was to report on the spawning seasonality of albacore in the South Pacific Ocean based on the use of oocyte development and gonadosomatic indices as indicators of spawning activity. Because adult albacore were needed to examine the various stages of reproductive development, sampling was limited to the longline fishery. Gonads were collected from longline vessels operating in the waters off New Caledonia and Tonga, January 1990 to February 1992 (Figure 3).

Length and sex data were collected on 1,105 albacore in the South Pacific (Figure 4). Size frequencies differed between males and females with males reaching larger sizes. Male albacore were encountered more often than female albacore and accounted for 68.9% of the samples from New Caledonia and 74.5% of the samples from Tonga.

Female albacore ovaries were examined for maturity and spawning seasonality. Female albacore appear to be capable of spawning once they reach 82 cm fork length based on oocyte development. Females with mature ovaries were taken 20-23°S from October to March. The peak spawning months for albacore in the South

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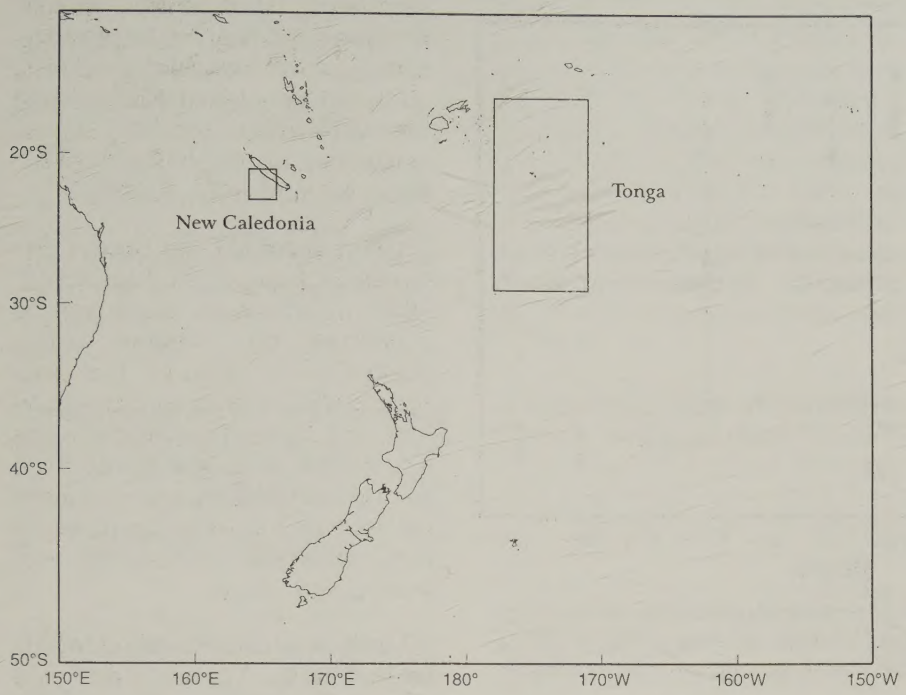

Figure 3. Sampling areas for albacore, *Thunnus alalunga*, in the South Pacific Ocean near New Caledonia and Tonga from 1990 to 1992.

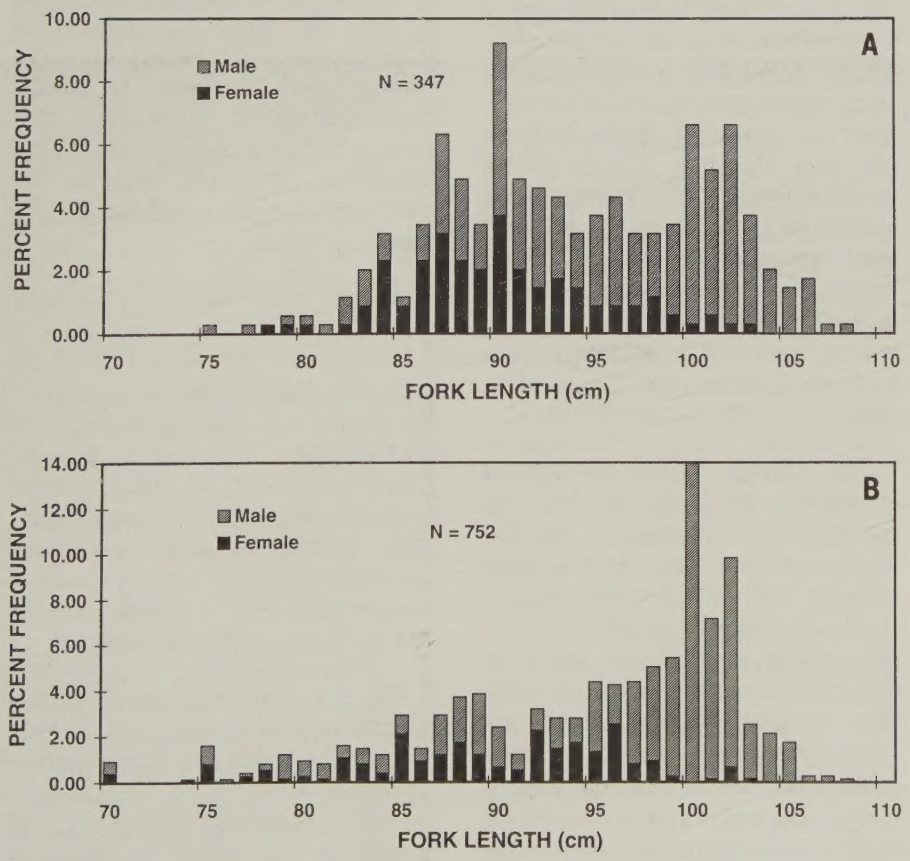

Figure 4. (A) Length-frequency distribution of albacore, *Thunnus alalunga*, sampled from New Caledonia, January 1990-February 1990; (B) Length-frequency distribution of albacore sampled from Tonga, January 1990-February 1990.

Pacific, November-February, occur during the austral summer (Figure 5, shown on next page).

RECENT SWFSC PUBLICATION

Editor's note: An abstract from a recently published paper written by a SWFSC scientist is presented in this space to announce its availability and to report results of tuna research conducted by Center staff.

"A MIXTURE MODEL FOR ESTIMATING DISCARDED BYCATCH FROM DATA WITH MANY ZERO OBSERVATIONS: TUNA DISCARDS IN THE EASTERN TROPICAL PACIFIC OCEAN"

Peter C. Perkins & Elizabeth F. Edwards, Southwest Fisheries Science Center, National Marine Fisheries Service, P.O. Box 271, La Jolla, California 92038-0271. *Published in U.S. Fishery Bulletin, Volume 94, pp. 330-340.*

Fisheries discard data are often characterized by a smooth distribution of positive amounts of per-set discard but with an extremely large number of zero observations. This discontinuity is difficult to fit with a standard distribution. One approach is to model per-set discard with a mixture of two distributions, with one component representing the zero observations and the other representing the observations of positive discard. In this paper, we describe such a mixture model that is suitable when the discard observations have been rounded to integer amounts. In particular, when "rounded" zeros (representing small amounts of discard) and "true" zeros (representing no discard) are indistinguishable in the data, the mixture model can be used to estimate the proportion of either. We fit this model to tuna discard data collected by observers aboard the U.S. tuna

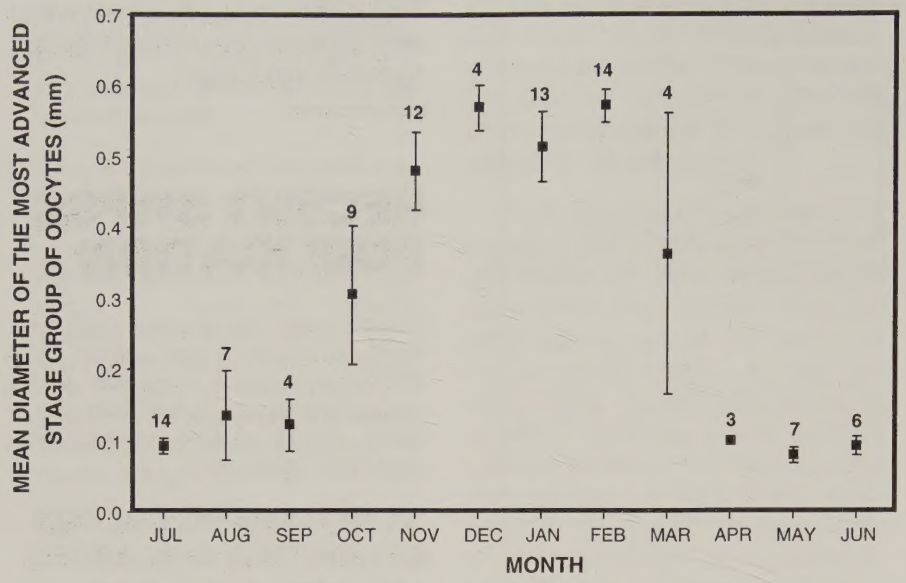

Figure 5. Monthly variation in mean diameter of the most advanced stage of oocytes for albacore, *Thunnus alalunga*, sampled from New Caledonia and Tonga, 1990 to 1992 (2 standard errors; n=97). Numbers above error bars indicate the sample size for each month.

purse-seine fleet in the eastern tropical Pacific Ocean during the years 1989-92. We use the model to estimate discard per set, allowing the model parameters to depend upon fishing strategy and geographic location, and we estimate mean discard per set fishery wide.

RECENT DEVELOPMENTS IN TUNA FISHERIES

Editor's note: The following news items, compiled from fishery trade and industry journals, newspapers and NMFS reports, are provided only as a service to our readers. The NMFS does not guarantee their accuracy.

UNITED STATES

U.S. Negotiates Historic Compliance Measures: An historic provision, proposed and negotiated by the United States at the annual meeting of the International Commission for the Conservation of Atlantic Tunas, establishes for the first time in an international fishery management organization a program for compliance with fish catch quotas by member nations. Additionally, ICCAT authorized countries to impose import bans against three non-member countries (Belize, Honduras and Panama) found to be undermining ICCAT's conservation regime for bluefin tuna. The import bans represent the first time multilateral trade measures have been authorized by an international fishery management organization to enforce compliance with conservation rules.

The United States considered compliance by both member and non-member countries to be the highest priority issue at the 1996 meeting of ICCAT. A major problem for ICCAT has been the lack of compliance with catch limits. With declining stocks, the compliance problem is magnified. The historic measure regarding members' compliance with catch limits for bluefin tuna in the western and eastern Atlantic and for North Atlantic swordfish calls for members to repay 100% of the value of any overharvests as an initial penalty. In addition, repeated over-harvests can result in other penalties, including quota reductions of at least 125% of the over-harvests and, as a last resort, import bans. (NOAA Press Release, November 29, 1996)

Giant Bluefin Tuna Study: Between February 22 and March 15, 1997, a three-week study will be conducted off Hatteras Island, North Carolina, wherein biologists from NMFS, Monterey Bay Aquarium, and Stanford University will be assisted by sport anglers in catching giant bluefin tuna and inserting internal recording devices to measure tuna movement and temperatures. (Associated Press)

Limited Access Proposal for Atlantic Sharks: A proposal designed to protect sharks in the Atlantic Ocean, Gulf of Mexico and Caribbean Sea by limiting fishing pressure on all of the 39 federally-managed species was announced by the NMFS. The plan would implement a limited access system for commercial shark fishermen to reduce overcapitalization of the shark fisheries and discourage derby fishing conditions where the "race for the fish" can cause overfishing and quota overruns.

"Overfishing of some shark species along with full use of others is a formula for too much fishing effort," said William Hogarth, chief of the NMFS's Highly Migratory Species Division. "This proposal will halt future expansion of these fragile fisheries and create a more reasonable balance between harvesting capacity and quota." Hogarth added that strong action is needed now to reduce both landings and effort.

The proposal would implement a limited access system for sharks that would create permit categories as either "directed" or "incidental," would develop eligibility criteria for these permits based on historical participation, and would specify rules to allow for transfer of permits.

(NOAA Press Release, December 23, 1996)

EASTERN PACIFIC

Record Mexican Tuna Consumption: The embargo imposed by the United States on Mexican tuna products has negatively affected Mexico's revenues during the past years. However, the embargo has also had a positive effect—an increase in Mexican tuna consumption. During 1995 Mexico consumed a record 155,000 mt of tuna, making it the fourth leading country worldwide in domestic tuna consumption. Part of the reason for the increase in consumption was an intensive promotional campaign. (INFOFISH *Trade News*, December 2, 1996)

More U.S. Ports for Canadian Tuna: In late December 1996, officials of the U.S. Dept. of State approached Canadian officials with an informal request to open three additional U.S. ports (Newport, Ore. Westport, Wash., and Honolulu, Hawaii) for Canadian landing of albacore tuna, in accordance with a 1981 bilateral treaty. (Associated Press)

UPCOMING TUNA MEETINGS

(Organizer; meeting type: sci=science, adm=administration)

- MAR 3-6. 2nd International Symposium on Pacific Swordfish. Kahuku, HI. (NMFS; sci)
- MAR 7. Interim Scientific Committee for Tunas and Tuna-Like Species in the North Pacific Ocean (ISC) Swordfish Working Group Meeting. Kahuku, HI. (NMFS; sci)
- MAR 10-14. Annual U.S.-Forum Fisheries Agency South Pacific Tuna Treaty Consultation. Port Vila, Vanuatu. (FFA;adm)
- MAY 19-22. 48th International Tuna Conference. Lake Arrowhead, CA. (IATTC; sci)
- JUN 3-5. Annual Meeting of the Inter-American Tropical Tuna Commission. San Jose, Costa Rica. (IATTC; adm)
- JUN 10-13. 2nd High-Level Multilateral Fisheries Conference. Majuro, Marshall Islands. (FFA; adm)
- DEC 3-5. 15th Northern Pacific Albacore Workshop. Nanaimo, BC, Canada. (Canadian Dept. of Fisheries and Oceans; sci)

WESTERN PACIFIC

The Z Fleet Collapses: One of the largest U.S. tuna fishing enterprises has collapsed. The "Z" fleet, operated by the Zuanich family of San Pedro, Calif., has foundered from overexpansion, debt and extended periods of low skipjack tuna prices. The fleet, which operated in the western Pacific's skipjack tuna fishery under the South Pacific Tuna Treaty, consisted of 12 superseiners and one freezer facility on the island of Tinian.

Six of the seiners carry mortgages guaranteed by the U.S. Government through the NMFS Loan Guarantee Program. According to the NMFS, the loan guarantees were made in the late 1980s and early 1990s, totaling approximately $21 million. The NMFS has arranged for the sale of the six seiners through the U.S. Dept. of Justice's Admiralty Branch in San Francisco, Calif. Another five of the vessels have been sold or are under court seizure. The Zuanich family will retain management of one vessel, *Daniela Z*, which is solvent and actively fishing in the western Pacific. (*Pacific Fishing*, December 1996)

Bluefin Tuna Farming: On January 29, 1997, the Japanese marine products firm, Maruha Corp., announced that it was withdrawing from a project to farm bluefin tuna, due to the project never being able to address bluefin cannibalism and rearing space problems nor become profitable. The government-affiliated Japan Sea Farming Association will assume responsibility for the project. (Dow Jones News)

Tuna Oil Venture: In early January 1997, an official of H.J. Heinz Company Australia Ltd. announced that H.J. Heinz was entering into a partnership with Australia's Clover Corp. Pty. Ltd. to refine tuna oil for sale to international food and pharmaceutical markets. Investment by the two companies in the venture, to be called Nu-Mega Lipids, will be less than $5 million, which includes costs for an extraction and refining facility in Melbourne, Australia. Heinz officials reported that pharmaceutical industry analysts have projected the global market for refined tuna oil will be around $400 million within 5 years. Tuna oil is reported to be used as a food additive to enhance nutrition and for treatment of certain medical conditions. (Dow Jones News)

EASTERN ATLANTIC

Tuna Longliners Detained by Irish Authorities: The lure of highly prized bluefin tuna has lead Japan and Korea to the waters off the west coast of Ireland, considered by the two countries as a new area with potential for their tuna fleets. Two Japanese tuna longline vessels, however, have already run into trouble with the Irish authorities, being arrested soon after their arrival for alleged illegal fishing inside the European Union waters 180 miles from Galway. An estimated 30-40 Japanese and Korean vessels began arriving at the edge of EU waters toward the end of August under the watchful eye of the Irish authorities. (*World Fishing*, October 1996)

Cultured Bluefin Market: More cultured bluefin tuna are coming into the Japanese sashimi market. The latest arrivals are from Spain. This is a result of a joint venture between a large trading company in Japan and its Spanish counterpart which started this project a year ago. About 10 pieces of purse seine caught fish which were reared in pens for five months are being flown in once a week. Fish quality is reportedly comparable with the Boston jumbo bluefin. The market has also been supplied by an increase in landings from Japanese domestic waters, particularly from the Amoi area. (INFOFISH *Trade News*, December 16, 1996)

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